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(54) **Spring buffer**

(57) In a spring buffer for retaining lines intended for fastening articles, tie rods (3) extending through the interior of a compression spring (1) are used, and these have at one end connection parts (5) for the retaining lines and at the other end abutments (6) by means of which they are each supported against one end of the compression spring (1). The tie rods consist of identically shaped parts and have stroke-limiting stops (4) for limiting the maximum stroke of the compression spring (1).

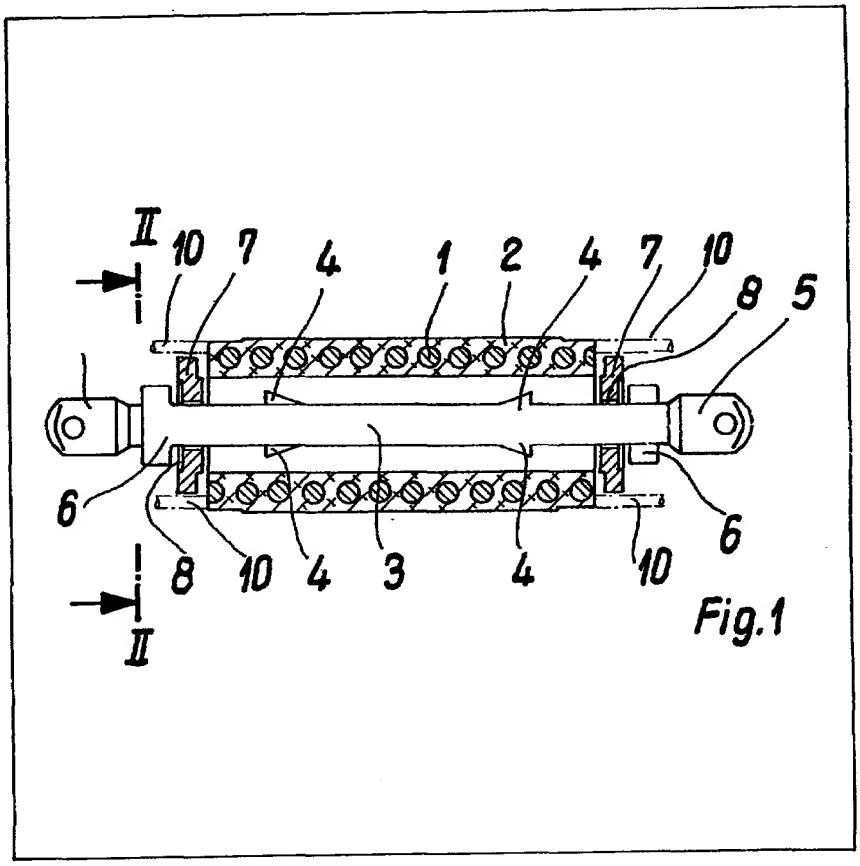

Fig.1

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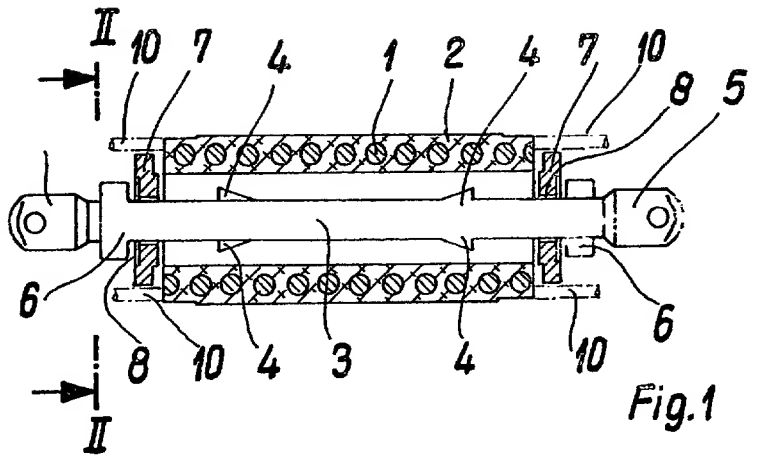

Fig.1

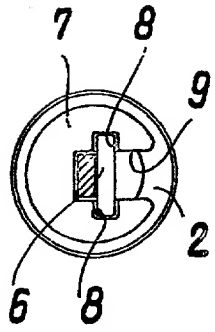

Fig.2

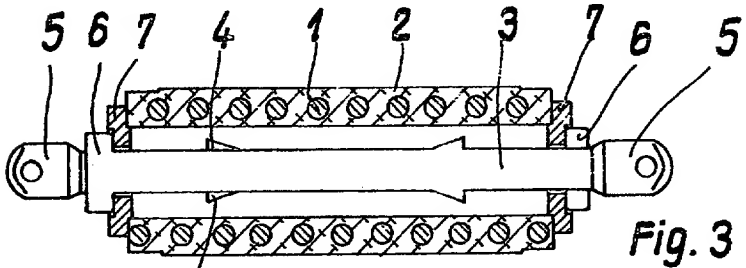

Fig. 3

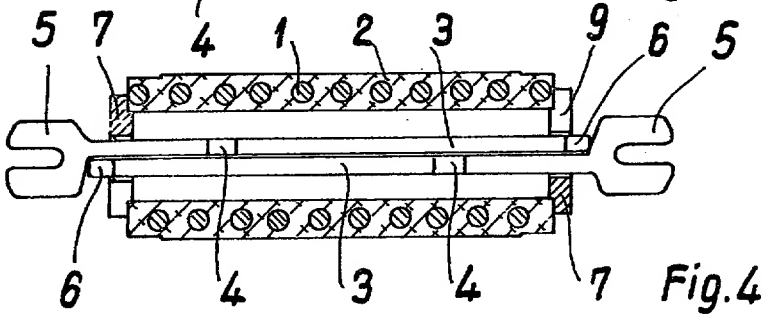

Fig.4

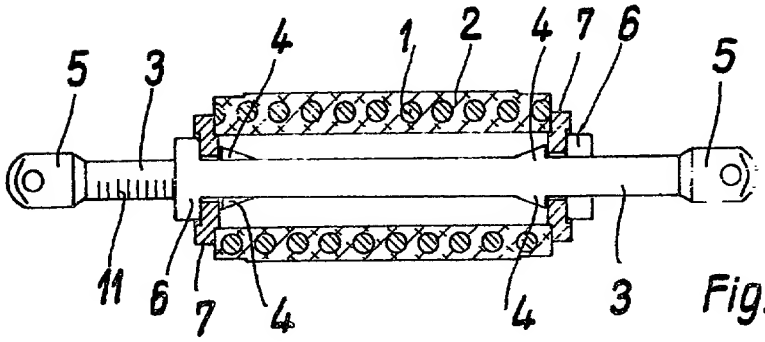

Fig. 5

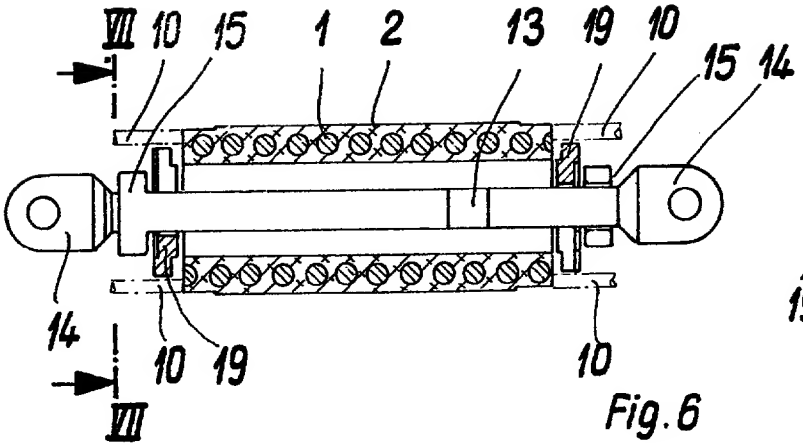

Fig.6

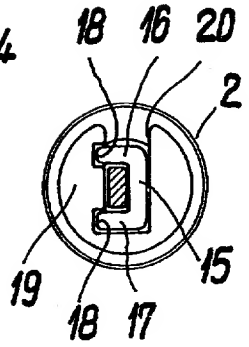

Fig.7

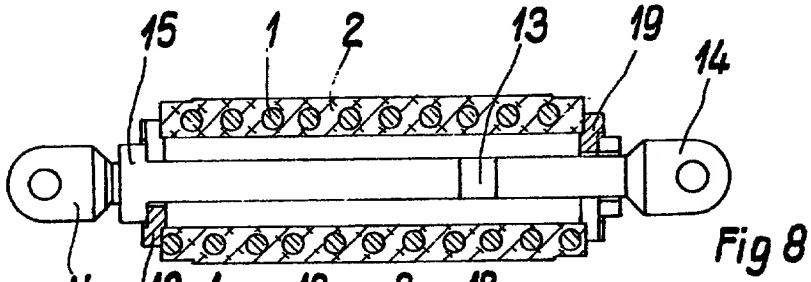

Fig 8

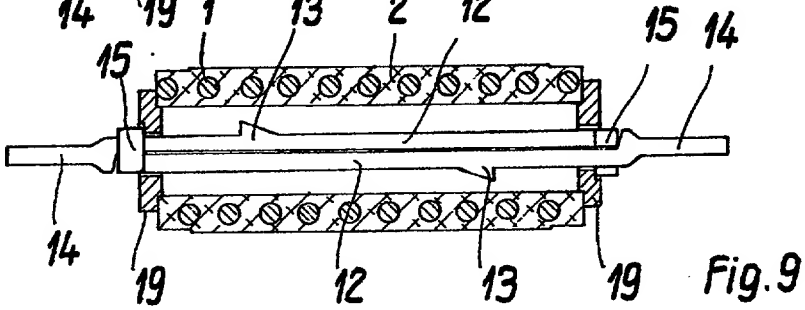

Fig.9

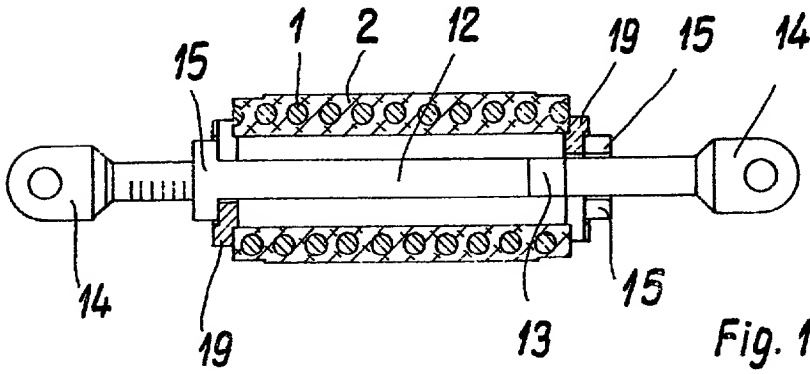

Fig. 10

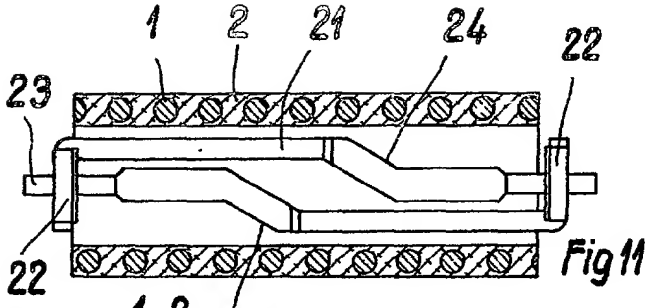

Fig 11

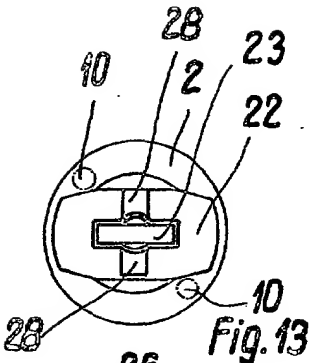

Fig. 13

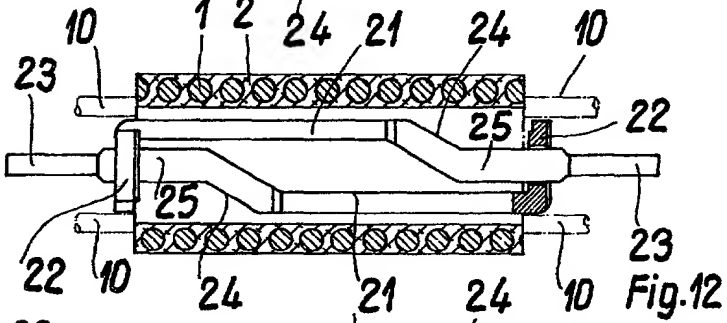

Fig.12

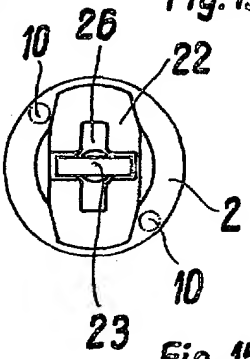

Fig. 15

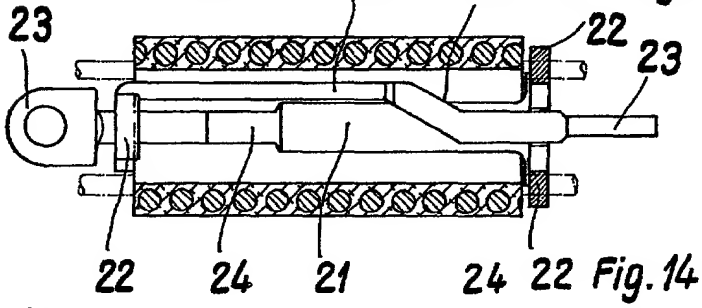

Fig. 14

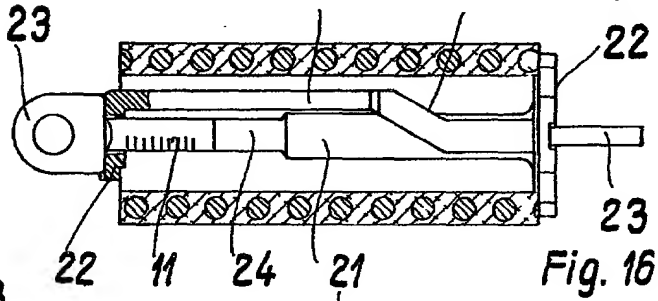

Fig. 16

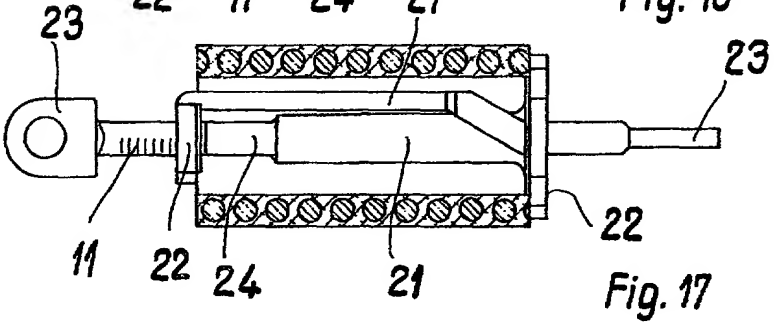

Fig. 17

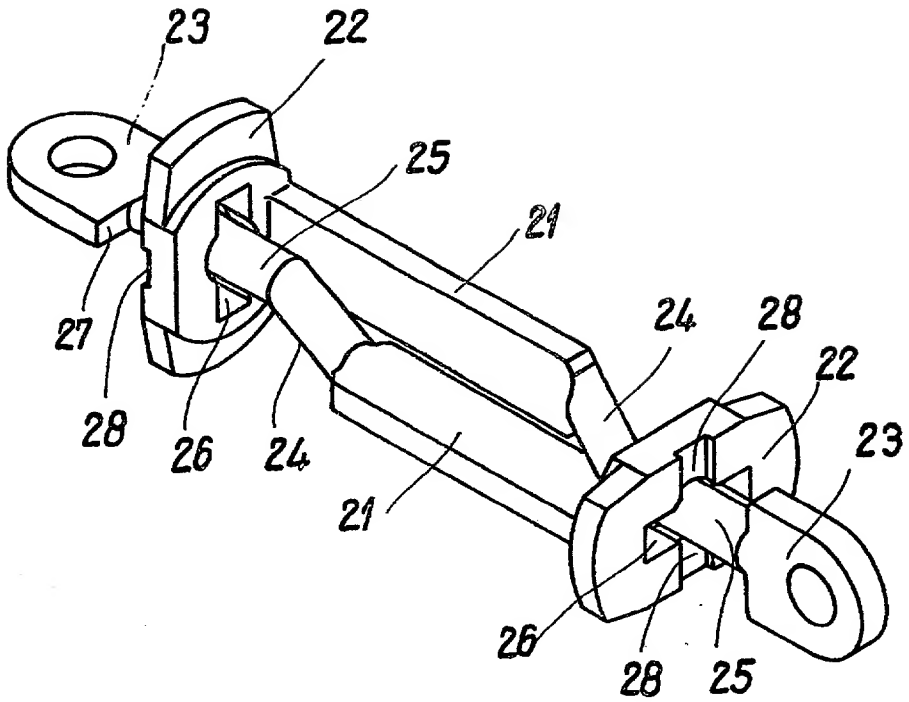

Fig. 18

SPECIFICATION

Spring buffer

The invention relates to a spring buffer for retaining lines intended for fastening articles, especially for lashing articles to vehicles, with connection parts, each located at one end of each of two tie rods and intended for the retaining lines and with abutments which are located at the ends of the tie rods facing away from the connection parts and which are each supported against one end of a compression spring.

A spring buffer of the type mentioned above is known from German Offenlegungsschrift 2,855,989. The known spring buffer cannot give full satisfaction inasmuch as its construction is very expensive. The complicated construction is caused, not least, by the fact that two differently shaped tie rods engaging into one another telescopically and enclosing the spring between them are used.

The object on which the invention is based is to provide a spring buffer of the type in question, which consists of simple parts, can be assembled easily and permits a compact design.

This object is achieved, according to the invention, when the tie rods extending through the interior of the compression spring consist of identically shaped parts which have stroke-limiting stops for limiting the maximum stroke of the compression spring.

The spring buffer according to the invention offers the advantage that it can be produced in an especially economical way, since its tie rods have the same shape. Because the tie rods are provided with stroke-limiting stops, the danger of overloading the compression spring is excluded. This proves especially advantageous when the compression spring is embedded in a rubber or plastic casing.

Further details and features of the invention emerge from the sub-claims and from the following description of several exemplary embodiments.

Figure 1 shows a first spring buffer during assembly;

Figure 2 shows a section along the line II-II in Figure 1;

Figure 3 shows a section through the ready-assembled spring buffer;

Figure 4 shows a section through the ready-assembled spring buffer according to Figure 3, pivoted through 90°;

Figure 5 shows a section, corresponding to Figure 3, through the spring buffer in its stop position;

Figure 6 shows a modified spring buffer in the assembled position;

Figure 7 shows a section along the line VII-VII in Figure 6;

Figure 8 shows the assembled spring buffer according to Figure 6 and 7;

Figure 9 shows a section through the spring buffer according to Figure 8, specifically in a position pivoted through 90° in relation to Figure 8;

Figure 10 shows the spring buffer according to Figures 6 to 9 in its stop position;

Figure 11 shows a further spring buffer during assembly;

Figure 12 shows the spring buffer according to Figure 11 during assembly in a second stage of assembly;

Figure 13 shows an end view of the spring buffer according to Figure 12;

Figure 14 shows the spring buffer according to Figures 11 to 13 in a further assembly position;

Figure 15 shows an end view, corresponding to Figure 13, of the spring buffer in the assembly position shown in Figure 14;

Figure 16 shows the assembled spring buffer in the position of rest;

Figure 17 shows the spring buffer according to Figure 16 in its stop position, and

Figure 18 shows, to make it easier to understand, a perspective representation of the tie rods of the spring buffer according to Figures 11 to 17, with the spring omitted.

In Figures 1 to 5, 1 denotes a compression spring which is designed as a helical spring and which is embedded in a casing 2 made of rubber or of an elastic plastic having elastic properties similar to those of rubber. The cylinder formed by the compression spring 1 and the casing 2 encloses parts of two tie rods 3 which have the same shape and consist of forgings. Each of the tie rods 3 is provided with stroke-limiting stops 4 arranged in pairs, which serve to limit the maximum stroke of the compression spring 1. The stroke-limiting stops are formed by projections of a flat portion of the tie rods 3. At the ends located opposite one another, the tie rods are each provided with a connection part 5 and a transverse yoke 6. 7 denotes crosspieces which form abutments for the compression spring 1 and have essentially the form of discs which each have engagement grooves 8 for a transverse yoke and have an introduction slot 9 for the tie rods. To transfer the crosspieces 7 into the operating position, the compression spring is compressed, during assembly, by means of rams 10 of an assembly device. As soon as the crosspieces have been transferred into the position shown in Figures 1 and 2, the rams 10 can be removed and the compression spring relaxed a certain amount. The parts thus change over to the position shown in Figures 3 and 4. Even in this position the compression spring 1 is under prestress.

Under load, the connection parts 5 move apart from one another until the stroke-limiting stops come to rest against the end faces of the crosspieces 7 facing one another. Further deformation of the compression spring is then no longer possible. Figure 5 illustrates the maximum-stroke position of the spring buffer according to Figures 1 to 4. As may also be seen in Figure 5, it is possible to provide at least one of the tie rods 3 with a scale 11 which indicates the magnitude of the forces occurring.

The spring buffer according to Figures 6 to 10 largely corresponds in its construction and mode of operation to the spring buffer according to Figures 1 to 5. In the second spring buffer, tie rods 12 each with a stroke-limiting stops 13 are used. Here also, the stroke-limiting stops 13 are each located between a connection part 14 and a transverse yoke 15. In this case, the transverse yoke 15 is made U-shaped, in contrast to the transverse yoke 6 of the first exemplary embodiment. As can best be seen

from Figure 7, the ends of the legs 16, 17 of the transverse yoke 15 are each supported in engagement grooves 18 of a disc-shaped crosspiece 19 which is again provided, in this case also, with an introduction slot 20.

Whereas, in the two exemplary embodiments described previously, the tie rods 3 and 13 were each provided with a transverse yoke 6 and 15 respectively, which was supported on the compression spring 1 via a crosspiece 7 and 19 respectively, that is to say, whereas, in the constructions described hitherto, each spring buffer consisted of five parts, the spring buffer according to Figure 11 to Figure 18 consists of only three parts. This is achieved by using tie rods 21, the transverse yoke 22 of which assumes the function of a crosspiece. Even in this case, each tie rod is provided with a stroke-limiting stop 24 between its end formed by the transverse yoke 22 and its other end formed by a connection part 23. In this case, however, the stroke-limiting stops are formed by an angled portion of the tie rods 21.

During assembly of the spring buffer according to Figures 11 to 18, the procedure is somewhat different to that for assembly of the spring buffer described previously. As indicated in Figure 11, the tie rods are first introduced into the interior of the casing 2. Subsequently, the compression spring 1 is compressed by means of rams 10, as indicated in Figures 12 to 14, specifically until cylindrical portions 25 enter the region of the transverse yokes 22. When this position indicated in Figures 12 and 13 is reached, one of the tie rods 21 is pivoted through 90°. After pivoting, the connection parts 23 are transverse to insertion slots 26 (see especially Figure 18) in the transverse yokes 22. When the compression spring 1 is subsequently relaxed, shoulders 27 of the connection parts 23 come to rest in engagement gro ves 28 of the transverse yokes 22.

Moreover, the transverse yokes have, on sides facing one another, guide extensions 29, by means of which the tie rods 21 are retained in a central position relative to the compression spring 1.

All the spring buffers described possess compression spring under constant prestress. They are distinguished by compactness and simple components. Assembly of the spring buffers described can be carried out within a very short time, and there is no need for machining of the component used.

Finally, the force distribution is also advantageous in the spring buffers described.

CLAIMS

1. A spring buffer for retaining lines intended for fastening articles, especially for lashing articles to vehicles, with connection parts, each located at one end of each of two tie rods and intended for the retaining lines and with abutments which are located at the ends of the tie rods facing away from the connection parts and which are each supported against one end of a compression spring, in which the tie rods extending through the interior of the compression spring comprise identically-shaped parts which have stroke-limiting stops for limiting the maximum stroke of the compression spring.

2. A spring buffer according to claim 1, in which the tie rods are made as forgings.

3. A spring buffer according to claim 1 or claim 2, in which the tie rods are provided, between an end forming a connection part and an end forming a transverse yoke, with at least one stroke-limiting stop.

4. A spring buffer according to any one of claims 1 to 3, in which the stroke-limiting stops are formed by projections of a flat basic body of the tie rods.

5. A spring buffer according to any one of claims 1 to 3, in which the stroke-limiting stops are formed by an angled portion of the tie rods.

6. A spring buffer according to any one of claims 3 to 5, in which the stroke-limiting stops of one tie rod are supported, in the maximum-stroke position of the spring buffer, on the transverse yoke of the respective other tie rod directly or with a crosspiece being interposed.

7. A spring buffer according to claim 6, in which the crosspieces are formed by discs with engagement grooves and with an introduction slot open on one side for the tie rods.

8. A spring buffer according to any one of claims 1 to 6, in which the compression spring is formed by a helical spring embedded in a casing made of rubber or an elastic plastic.

9. A spring buffer substantially as described herein with reference to the accompanying drawings.

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